Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of the claims in the application:

Listing of Claims:

1. (cancelled)

2. (cancelled)

3. (currently amended) A photonic switch for a DWDM network comprising:
a plurality I of input ports and a plurality I' of output ports;
an optical demultiplexer for separating a wavelength λ_k from an input multichannel signal $S_{in}(k,i)$ received on an input port i of said plurality of input ports, and for directing said wavelength λ_k on an assigned ingress area along a predetermined input path;
a switching block for directing said wavelength λ_k along an optical path from said assigned ingress area to an associated egress area selected from a plurality of egress areas;
an optical multiplexer for directing said wavelength λ_k from said associated egress area along a predetermined output path, and for combining said wavelength λ_k into an output multichannel signal $S_{out}(k',i')$, transmitted on an output port i' of said plurality of output ports;
wherein at least one of the optical demultiplexer and optical multiplexer includes a diffraction grating;
wherein said switching block comprises a three-dimensional switch fabric for cross-connecting said wavelength λ_k from said input multichannel signal $S_{in}(k,i)$ to said output multichannel signal $S_{out}(k',i')$ and a control unit for selecting said associated egress area and for configuring said switch fabric to direct said wavelength along an adaptable path between said assigned ingress area and said associated egress area and,

wherein said switch fabric comprises an input matrix with K rows and I columns of input optical switching elements defining a first plane, and an output matrix with K' rows and I' columns of output optical switching elements defining a second plane; wherein each input port of said plurality of input ports is associated with a column of said input matrix and each wavelength arriving on said each input port is associated with a row of said input matrix, and wherein each output port of said plurality of output ports is associated with a column of said output matrix and each wavelength transmitted at each said output port is associated with a row of said output matrix and wherein said adaptable path transits said switch fabric such ~~than~~ that an input optical switching element of said input matrix redirects said wavelength away from a ~~plane of said input matrix~~ the first plane towards the second plane to an output optical switching element of said output matrix.

4. (previously presented) A photonic switch as claimed in claim 3, wherein said switching elements have a minimum of four degrees of freedom of orientation.

5. (original) A photonic switch as claimed in claim 3, wherein said switching elements are 3-D MEMS mirrors.

6. (previously presented) A photonic switch as claimed in claim 3, wherein said optical demultiplexer and said input ports are arranged in a predetermined position relative to each other along said predetermined input path, for separating each input multichannel signal into component wavelengths according to an angle of incidence of said input multichannel signal on said demultiplexer.

7. (original) A photonic switch as claimed in claim 6, wherein said demultiplexer and said input matrix are arranged in a predetermined position relative to each other along said predetermined input path, for directing each said component wavelength from said demultiplexer to said input matrix according to said wavelength λ_k and said input port i.

8. (cancelled)

9. (previously presented) A photonic switch as claimed in claim 3, wherein said multiplexer and said output ports are arranged in a predetermined position relative to each other along said predetermined output path, for combining all wavelengths arriving in a certain area of incidence on said multiplexer within an output port.

10. (previously presented) A photonic switch as claimed in claim 9, wherein said demultiplexer and said output matrix are arranged in a predetermined position relative to each other, for directing each said wavelength λ_k from said output matrix to said certain area of incidence according to said wavelength λ_k and said input port i.

11. (previously presented) A photonic switch as claimed in claim 10, further comprising optical elements arranged along said predetermined output path for directing said wavelength from said egress area on said output port.

12. (previously presented) A photonic switch as claimed in claim 3, wherein l=l' and i=i'.

13. (previously presented) A photonic switch as claimed in claim 3, wherein K=K', k=k', l=l' and i=i'.

14. (previously presented) A photonic switch as claimed in claim 3, wherein said switch fabric further comprises an add zone for cross-connecting an add wavelength incident on said add zone to said output multichannel signal; and
said control unit further capable of configuring said switch fabric to direct said add wavelength along an adaptable add path between said add zone and said associated egress area.

15. (original) A photonic switch as claimed in claim 14, further comprising a plurality of add ports.

16. (previously presented) A photonic switch as claimed in claim 15,

wherein said input matrix further comprises an add zone of M rows and N columns of input optical switching elements, wherein each add port of said plurality of add ports is associated with a column of said add zone and each wavelength arriving on said each add port is associated with a row of said add zone.

17. (previously presented) A photonic switch as claimed in claim 3, further comprising at least one drop port,

wherein said switch fabric further comprises a drop zone for cross-connecting a drop wavelength from said input multichannel signal on said drop zone; and

a control unit for configuring said switch fabric to direct said drop wavelength along an adaptable drop path between said assigned ingress area and said drop zone.

18. (previously presented) A photonic switch as claimed in claim 17, further comprising a plurality of drop ports.

19. (previously presented) A photonic switch as claimed in claim 18, wherein said switch fabric further comprises a drop zone of M' rows and N' columns of output optical switching elements, wherein each drop port of said plurality of drop ports is associated with a column of said drop zone and each wavelength arriving on said each drop port is associated with a row of said drop zone.

20. (currently amended) A method of routing a wavelength within a photonic three dimensional switch fabric of a DWDM network, comprising:

pre-establishing an input optical path between an input port associated with said wavelength, through an assigned ingress area to an assigned optical input switching element of an input matrix [[,]] according to a connectivity map, the input matrix including a plurality of input optical switching elements defining a first plane;

establishing an adaptable path from said assigned optical input switching element to an associated output optical switching element of an output matrix, the output matrix including a plurality of output optical switching elements defining a second plane, wherein said adaptable path transits said switch fabric such that ~~an~~ the assigned optical input optical switching element of said input matrix redirects said wavelength away from

~~a plane of said input matrix~~ the first plane ~~to an~~ towards the second plane and the associated output optical switching element of said output matrix; and

pre-establishing an output optical path between said associated optical switching element through an associated egress area to an output port of interest according to said connectivity map;

wherein at least one of the input optical path and the output optical path includes a diffraction grating.

21. (original) A method as claimed in claim 20, further comprising

transiting said adaptable route to connect said assigned optical switching element to another optical switching element of said output matrix, whenever said connectivity map changes.

22. (currently amended) A photonic switch for routing a plurality of wavelengths of a DWDM transport network, between a plurality of input ports and a plurality of output ports comprising:

an all-optical three-dimensional switch fabric for cross-connecting a wavelength λ_k from an optical input multichannel signal $S_{in}(k,i)$ to an optical output multichannel signal $S_{out}(k',i')$, along an adaptable optical path;

a control unit for configuring said adaptable optical path;

an optical demultiplexer for separating said wavelength λ_k from said optical input multichannel signal $S_{in}(k,i)$ and directing said wavelength λ_k on an assigned ingress area of said all-optical switch fabric along a predetermined input path; and

an optical multiplexer for receiving said wavelength λ_k received along a predetermined output path from an associated egress area of said all-optical switch fabric, and combining said wavelength λ_k with said optical output multichannel signal $S_{out}(k', i')$;

wherein at least one of the optical demultiplexer and optical multiplexer includes a diffraction grating;

wherein said all-optical switch fabric comprises an input matrix of K rows and I columns of optical switching elements defining a first plane, and an output matrix with K' rows and I' columns of output optical switching elements defining a second plane,

wherein said adaptable path transits said all-optical switch fabric such that an input optical switching element of said input matrix and of said first plane redirects said wavelength away from ~~a plane~~ the first plane ~~of said input matrix to an~~ towards the second plane and an output optical switching element of said output matrix and of said second plane;

wherein each input port of said plurality of input ports is associated with a column of said input matrix, and each wavelength of said plurality of wavelengths is associated with a row of said input matrix; and

wherein each output port of said plurality of output ports is associated with a column of said output matrix and each wavelength of said plurality of wavelengths is associated with a row of said output matrix.

23. (cancelled)

24. (cancelled)

25. (cancelled)

26. (cancelled)

27. (previously presented) A photonic switch as claimed in claim 22, further comprising an add port, and wherein said all-optical switch fabric comprises

an add zone of M rows and N columns of input optical switching elements, wherein said add port is associated with a column of said add zone and each wavelength arriving on said add port is associated with a row of said add zone.

28. (cancelled)

29. (previously presented) A photonic switch as claimed in claim 22, further comprising a drop port wherein said switch fabric comprises

a drop zone of M' rows and N' columns of optical switching elements,

wherein said drop port is associated with a column of said drop zone and each wavelength arriving on said drop port is associated with a row of said drop zone.

30. (original) A photonic switch as claimed in claim 3, wherein said input and said output matrices are arranged in two different planes.

31. (previously presented) A photonic switch as claimed in claim 30, wherein said planes are substantially parallel to each other.

32. (previously presented) A photonic switch as claimed in claim 3 wherein said input and output matrices are arranged substantially in the same plane and wherein said switching block further comprises directing means arranged in the path of the light between said input and output matrices.

33. (cancelled)

34. (cancelled)

35. (previously presented) The method of routing a wavelength within a photonic switch of claim 20, wherein at least one of the input optical path and the output optical path includes a diffraction grating.